Small Business Innovation Research/Small Business Tech Transfer

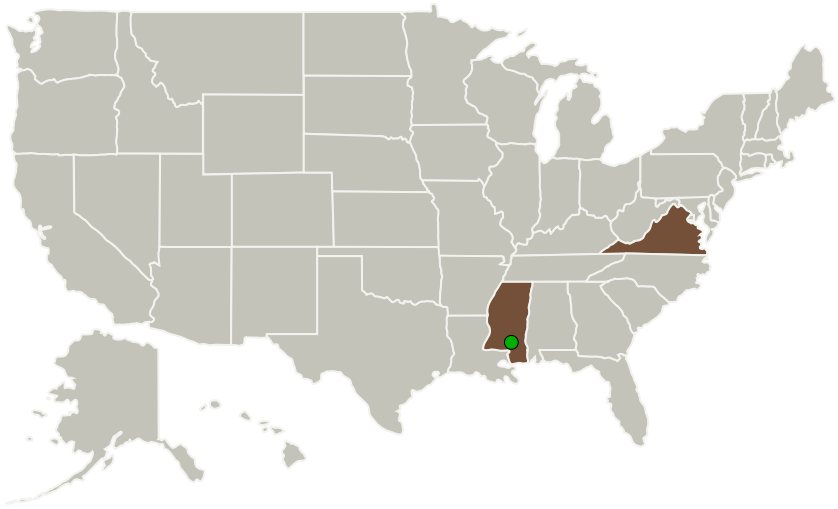
Wireless Networked Sensors for Remote Monitoring in Propulsion Systems, Phase I

Completed Technology Project (2016 - 2017)

Project Introduction

This NASA Phase I SBIR program would fabricate wireless networked nanomembrane (NM) based surface pressure sensors for remote monitoring in propulsion systems, using SOI (Silicon on Insulator) NM techniques in combination with our pioneering HybridSil ceramic nanocomposite materials. Such low-modulus, conformal nanomembrane sensor skins with integrated interconnect elements and electronic devices can be applied to new or existing propulsion systems for acoustic surface pressure analysis. During this NASA SBIR, we will transition the wireless semiconductor nanomembrane sensors from their current concept and prototype stage to instrumentation products of use to NASA's propulsion facilities, other NASA aerostructure instrumentation programs, academic researchers and industrial technologists. We will perform synthesis of sensor skin materials with optimized transduction, hysteresis and environmental properties, specifically for high Reynold's number flow and also varying temperature use. Support wireless electronics will be optimized to acquire, multiplex, store and process raw sensor array data.

Primary U.S. Work Locations and Key Partners



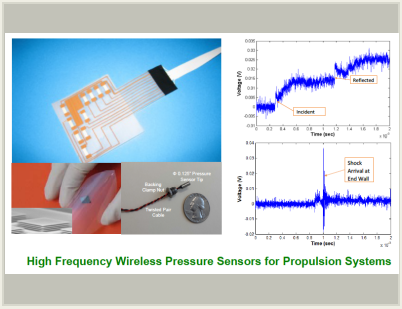


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Table of Contents

Wireless Networked Sensors for Remote Monitoring in Propulsion Systems, Phase I

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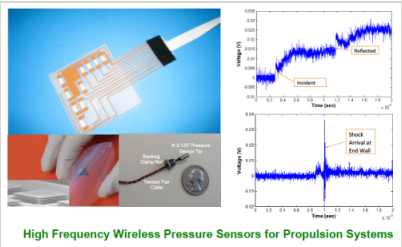
Organizations Performing Work	Role	Type	Location
Nanosonic, Inc.	Lead Organization	Industry	Pembroke, Virginia
Stennis Space Center(SSC)	Supporting Organization	NASA Center	Stennis Space Center, Mississippi
Virginia Tech - Mechanical Engineering Department	Supporting Organization	Academia	Blacksburg, Virginia

Primary U.S. Work Locations	
Mississippi	Virginia

Images



Briefing Chart Image
Wireless Networked Sensors for Remote Monitoring in Propulsion Systems, Phase I
(https://techport.nasa.gov/image/132966)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Nanosonic, Inc.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

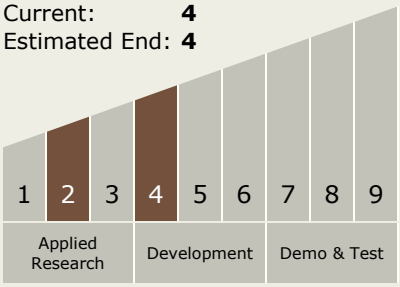
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Hang Ruan

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX13 Ground, Test, and Surface Systems
  - TX13.2 Test and Qualification
    - TX13.2.7 Test Instruments and Sensors

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System